WE CLAIM:

1. A device for acoustically ejecting a droplet of fluid from each of a plurality of fluid reservoirs, comprising:

a plurality of reservoirs each adapted to contain a fluid;

an acoustic ejector; and

means for sequentially positioning each of the reservoirs relative to the acoustic ejector at a predetermined distance therefrom, and, when an acoustic coupling medium is present between each reservoir and the acoustic ejector, in acoustic coupling relationship therewith.

2. The device of claim 1, wherein the acoustic ejector is comprised of an acoustic radiation generator for generating acoustic radiation

3. The device of claim 1, wherein the acoustic ejector is comprised of a focusing means for focusing the acoustic radiation generated.

4. The device of claim 3, wherein the focusing means is comprised of a solid member having a curved surface.

5. The device of claim 3, wherein each reservoir is adapted to contain a fluid having a free surface and the focusing means causes acoustic waves from the acoustic ejector to converge at a focal point near the free surface.

6. The device of claim 1, wherein the acoustic ejector comprises an acoustic transducer.

7. The device of claim 6, further comprising a controller for controlling the acoustic ejector.

8. The device of claim 1, further comprising a detector for detecting a fluid level or volume in the reservoirs.

9. The device of claim 1, wherein the reservoirs and the ejector are movable with respect to each other.

10. The device of claim 1, further comprising a substrate for receiving droplets from the reservoirs, wherein the substrate is movable relative to the ejector.

11. The device of claim 8, wherein the acoustic ejector comprises an acoustic transducer and a focusing means in operative association with the acoustic transducer for focusing acoustic radiation emitted by the acoustic transducer, the device further comprising:

an acoustic coupling medium interposed between the focusing means and the reservoirs; and

a controller in operable communication with the ejector, wherein the controller is adapted to adjust the acoustic radiation emitted by the acoustic transducer.

12. The device of claim 8, wherein the acoustic ejector comprises an acoustic transducer and a focusing means in operative association with the acoustic transducer for focusing acoustic radiation emitted by the acoustic transducer, the device further comprising:

an acoustic coupling medium interposed between the focusing means and the reservoirs; and

a controller in operable communication with the ejector, wherein the controller is adapted to adjust the intensity of acoustic radiation emitted by the acoustic transducer.

13. The device of claim 8, wherein the acoustic ejector comprises an acoustic transducer and a focusing means in operative association with the acoustic transducer for focusing acoustic radiation emitted by the acoustic transducer, the device further comprising:

an acoustic coupling medium interposed between the focusing means and the reservoirs; and

a controller in operable communication with the ejector, wherein the controller is adapted to adjust the duration of acoustic radiation emitted by the acoustic transducer.

14. The device of claim 8, wherein the acoustic ejector comprises an acoustic transducer and a focusing means in operative association with the acoustic transducer for focusing acoustic radiation emitted by the acoustic transducer, the device further comprising:

an acoustic coupling medium interposed between the focusing means and the reservoirs; and

a controller in operable communication with the ejector, wherein the controller is adapted to adjust the relative position reservoirs with the ejector in response to a change in fluid level or volume detected by the detector.

15. The device of claim 1, wherein one of the reservoirs is a first well containing a first fluid.

16. The device of claim 15, wherein the reservoirs and the ejector are movable with respect to each other.

17. The device of claim 16, wherein the first fluid has a free surface and the device further comprises a means for maintaining the ejector and the free surface at the same distance as the volume of first fluid in the first well decreases.

18. The device of claim 16, wherein the acoustic ejector is adapted to move to compensate for any changes in the level of the first fluid in the first well.

19. The device of claim 16, wherein the means for positioning the reservoirs is adapted to move to compensate for any changes in the level of the first fluid in the first well.

20. The device of claim 16, wherein the acoustic ejector comprises an acoustic transducer and a focusing means that focuses acoustic radiation toward a free surface of the first fluid.

21. The device of claim 1, further comprising a means for interposing the acoustic coupling medium between the acoustic ejector and the reservoirs for transmitting acoustic radiation therebetween.

22. The device of claim 15, wherein another one of the reservoirs is a second well adjacent to the first well and the means for positioning the reservoirs is adapted to move so that the second well in position to allow the acoustic ejector to eject a droplet of a second fluid from the second well.

23. The device of claim 22, wherein the first and second wells form a portion of a well plate.

24. The device of claim 1, wherein one of the reservoirs is a first well for holding a first fluid and the first well is removable from the means for positioning the reservoirs.

25. The device of claim 24, wherein the first well forms a portion of a well plate.

26. The device of claim 1, wherein the acoustic ejector has a curved surface for contacting the acoustic coupling medium and to focus acoustic radiation from the acoustic ejector toward a surface of a fluid containing a reservoir.

27. The device of claim 1, further comprising a controller for controlling the means for position the reservoirs.

28. The device of claim 1, further comprising a biomolecule in a reservoir.

29. The device of claim 28, wherein the biomolecule is nucletidic, peptidic, polynucleotic, polypeptidic, cellular, or a combination thereof.

30. The device of claim 1, further comprising a chemical compound in a reservoir.

31. The device of claim 30, wherein the compound is a solvent.

32. The device of claim 1, wherein the acoustic ejector is adapted to eject a droplet up to about 1 picoliter in volume.

33. The device of claim 28, wherein the biomolecule is mononucleotidic or oligonucleotic.

34. The device of claim 28, further comprising substrate for receiving one or more droplets from the reservoirs.

35. The device of claim 34, wherein the substrate contains one or more moieties.

36. The device of claim 44, wherein the one or more moieties are biochemical or chemical compounds

37. The device of claim 36, wherein the one or more moieties comprise a polypeptide.

38. A device for acoustically ejecting a droplet of fluid from a reservoir onto a substrate, the device comprising an acoustic ejector and a means positioning the reservoir, wherein:

the means for positioning the reservoir is adapted to position the reservoir relative to the acoustic ejector whereby the acoustic ejector is coupled to a first surface of the reservoir by an acoustic coupling medium interposed between the acoustic ejector and the first surface of the reservoir, such that

an acoustic wave generated by the acoustic ejector is transmitted through the acoustic coupling medium to the first surface of the reservoir and thereafter propagates through the reservoir into the fluid on a second surface of the reservoir opposite the first surface of the reservoir, causing controlled ejection of a droplet of the fluid from the reservoir.